Polar Knowledge Canada

2016–17

Report on Plans and Priorities

The Honourable Carolyn Bennett, P.C., M.P.
Minister of Indigenous and Northern Affairs

© Her Majesty the Queen in Right of Canada,
represented by the President and Chief Executive Officer of Polar Knowledge Canada, 2016

Report on Plans and Priorities 2016-17
Catalogue No. R101-2E-PDF
ISSN 2369-9485

Polar Knowledge Canada: https://www.canada.ca/en/polar-knowledge

Inquiries: info@polar.gc.ca

Cette publication est également disponible en français.

Table of Contents

Minister's Message 1

President's Message 3

Section I: Organizational Expenditure Overview 5

- Organizational Profile 5
- Organizational Context 6
- Alignment of Spending With the Whole-of-Government Framework 15
- Departmental Spending Trend 16
- Estimates by Vote 16

Section II: Analysis of Programs by Strategic Outcome 17

- Strategic Outcome: Canada has world-class Arctic science & technology 17
  - Program 1.1: Science and Technology for the North 18
  - Sub-Program 1.1.1: Science and Monitoring 19
  - Sub-Program 1.1.2: Technology Development and Transfer 20
  - Program 1.2: Polar Knowledge Application 21
  - Sub-Program 1.2.1: Knowledge Management 23
  - Sub-Program 1.2.2: Outreach and Capacity Building 25
  - Internal Services 27

Section III: Supplementary Information 29

- Future-Oriented Condensed Statement of Operations 29
- Supplementary Information Tables 30
- Tax Expenditures and Evaluations 30

Section IV: Organizational Contact Information 31

Appendix: Definitions 33

Endnotes 37

Minister's Message

This 2016-17 Report on Plans and Priorities of Polar Knowledge Canada provides information on how the agency will support the Government on achieving our agenda in the coming year and I am fully confident that Polar Knowledge Canada is prepared to successfully support me and work with our partners inside and outside government to deliver for Canadians. However, given our commitment to more effective reporting, this year's report will be the final submission using the existing reporting framework.

The Prime Minister and the President of the Treasury Board are working to develop new, simplified and more effective reporting processes that will better allow Parliament and Canadians to monitor our Government's progress on delivering real change to Canadians. In the future, Polar Knowledge Canada's reports to Parliament will focus more transparently on how we are using our resources to fulfill our commitments and achieve results for Canadians.

These new reporting mechanisms will allow Canadians to more easily follow our Department's progress towards delivering on our priorities, which were outlined in the Prime Minister's mandate letter to me http://pm.gc.ca/eng/minister-indigenous-and-northern-affairs-mandate-letter.

The Government of Canada is committed to renewing the relationship between Canada and Indigenous Peoples, protecting our communities from the challenges of climate change, enhancing ways Canadians and indigenous groups can participate in the review and monitoring of major resource development projects, improving the physical infrastructure in Canada and indigenous communities, ensuring food security in northern communities, and promoting economic development and creating jobs. Polar Knowledge Canada, as a new Government of Canada and northern-focused agency, contributes to the objective to advance Canada's knowledge of the polar regions in order to improve economic opportunities, environmental stewardship, and the quality of life of Northerners and all Canadians.

The main activities being carried out by Polar Knowledge Canada include collection of baseline information and monitoring, scientific research, technology development, knowledge mobilisation, outreach and capacity building.

The Canadian High Arctic Research Station (CHARS) in Cambridge Bay, Nunavut, will provide a world-class hub for science and technology in Canada's North that complements and anchors the diverse network of research and monitoring facilities across the North.

Polar Knowledge Canada will continue to work in close partnership with national and international networks of circumpolar expertise. It will leverage existing polar capabilities and serve as Canada's primary point of contact with the circumpolar knowledge community; actively seek to establish agreements and partnerships with polar research agencies at the national and international level; and attract international scientists to work in Canada.

A key focus will be involving and engaging with stakeholders and indigenous groups, and building capacity at the community level through training and participation in science and technology projects. Input will be sought from local communities in the development of research plans and implementation of technology projects. Engagement is and will continue to be an integral part of Polar Knowledge Canada's science and technology activities, knowledge management and engagement, and decision-making.

Finally, a key role of Polar Knowledge Canada is to synthesize scientific information, assess the policy implications and publish knowledge products for decision-makers as well as science reports that translate the results of science activities into a language that is amenable for public consumption.

Canada's North is undergoing major change at this time. Polar Knowledge Canada and its Canadian High Arctic Research Station will be critical to helping us better understand and respond to these changes, representing a major step forward for Canada and Northerners.

The Honourable Carolyn Bennett, P.C., M.P.
Minister of Indigenous and Northern Affairs

President's Message

On June 1, 2015, the *Canadian High Arctic Research Station Act* came into force and Polar Knowledge Canada (POLAR) was officially established as a new federal research organization. This new federal organization combines the mandate and resources of the former Canadian Polar Commission and the pan-northern science and technology program associated with the Canadian High Arctic Research Station (CHARS) initiative at Aboriginal Affairs and Northern Development Canada into one organization. Although the Research Station is only expected to be operational in 2017, we are moving ahead with a number of science and technology projects.

Our overall priorities for the first 5-year cycle of the science and technology program are:

- Alternative and renewable energy for the North
- Baseline information to prepare for northern sustainability
- Predicting the impacts of changing ice, permafrost and snow on shipping, infrastructure and communities
- Catalyzing improved design, construction and maintenance of northern built infrastructure.

In parallel, we are implementing a number of initiatives to facilitate better access to scientific information, to provide value added knowledge products to inform decision-makers, to create greater awareness of Arctic science and technology in Canada and internationally, and to build capacity in northern communities through participation in science and technology projects.

In light of its mandate to also promote the development and dissemination of knowledge of the other circumpolar regions, including the Antarctic, POLAR also coordinates Canada's efforts to develop a modest national Antarctic research program, representing Canada in the international scientific community and communicating Antarctic opportunities to the Canadian polar research community. The Antarctic focus is important given that like the Arctic, there is a direct connection of the Antarctic and Southern Ocean to global environmental systems.

Finally, we are honoured and enthusiastic about the creation of a new Government of Canada northern-focused research organization and are working hard to bring together a very strong and capable team to deliver this very exciting mandate.

The priorities that we have set forth in this Report provide a clear plan of action and, with the help of our dedicated staff, will enable Polar Knowledge Canada to advance our knowledge of the polar regions and be recognized as a leader on circumpolar research issues.

David J. Scott, Ph.D.
President and Chief Executive Officer

Section I: Organizational Expenditure Overview

Organizational Profile

Minister: The Honourable Carolyn Bennett, P.C., M.P.

Chairperson: Mr. Richard Boudreault, Chairperson

Deputy Head: Dr. David J. Scott, President and Chief Executive Officer

Ministerial Portfolio: Indigenous and Northern Affairs

Enabling Instrument(s): *Canadian High Arctic Research Station*

Year of Incorporation / Commencement: 2015

Web site: https://www.canada.ca/en/polar-knowledge.html

Other: Administration of the Polar Knowledge Canada (POLAR) is overseen by a nine-member Board of Directors, including a Chairperson and Vice-Chairperson. The Board approves the organization's science and technology plan and annual work plans and budget. The Board is accountable to the Minister of Indigenous and Northern Affairs. All positions are appointed by Order-in-Council to hold office for terms not exceeding five years, and are eligible for re-appointment for a second term of office. Members of the Board of Directors hold office on a part-time basis.

Organizational Context

Raison d'être

Polar Knowledge Canada (POLAR) is a federal agency (departmental corporation) that was established with the coming into force of the *Canadian High Arctic Research Station Act* on June 1, 2015. The Act merged the mandate and functions of the Canadian Polar Commission and the pan-northern science and technology program associated with the Canadian High Arctic Research Station (CHARS) project of AANDC (now INAC).

The purpose of Polar Knowledge Canada as stated in the *Act* is to:

- Advance knowledge of the Canadian Arctic in order to improve economic opportunities, environmental stewardship and the quality of life of its residents and all other Canadians
- Promote the development and dissemination of knowledge of the other circumpolar regions, including the Antarctic
- Strengthen Canada's leadership on Arctic issues
- Establish a hub for scientific research in the Canadian Arctic.

Responsibilities

The functions of Polar Knowledge Canada are to:

- Undertake scientific research and develop technology
- Implement scientific research and technology development programs and projects
- Promote the testing, application, transfer, diffusion and commercialization of technology
- Publish and disseminate studies, reports and other documents
- Complement national and international networks of expertise and of facilities.

Polar Knowledge Canada will eventually be headquartered at the Canadian High Arctic Research Station (CHARS) in Cambridge Bay, Nunavut, once the station is operational in 2017. The CHARS campus will encompass a main research building, a field and maintenance building and triplex accommodation units for visiting researchers and scientists. CHARS construction project will be managed by INAC until commissioning is complete in 2017. It will then become part of Polar Knowledge Canada. Key elements of the governance arrangements are:

- Polar Knowledge Canada reports to the Minister, Indigenous and Northern Affairs
- A nine member Board of Directors is responsible for the long-term strategic direction and governance decisions
- The President, as the Deputy Head, is the Chief Executive Officer and is accountable for day-to-day management of Polar Knowledge Canada
- Science and Technology is responsible for managing the implementation of the Science and Technology Program; Knowledge Management and Engagement is responsible for knowledge mobilization, communications, outreach and capacity building activities; and Human Resources and Corporate Services is responsible for internal services.

Strategic Outcome and Program Alignment Architecture

Strategic Outcome: Canada has world-class Arctic science and technology to support the development and stewardship of Canada's North and is recognized as a leader on circumpolar research issues.

1.1 Program: Science and Technology for the North

1.1.1 Sub-Program: Science and Monitoring

1.1.2 Sub-Program: Technology Development and Transfer

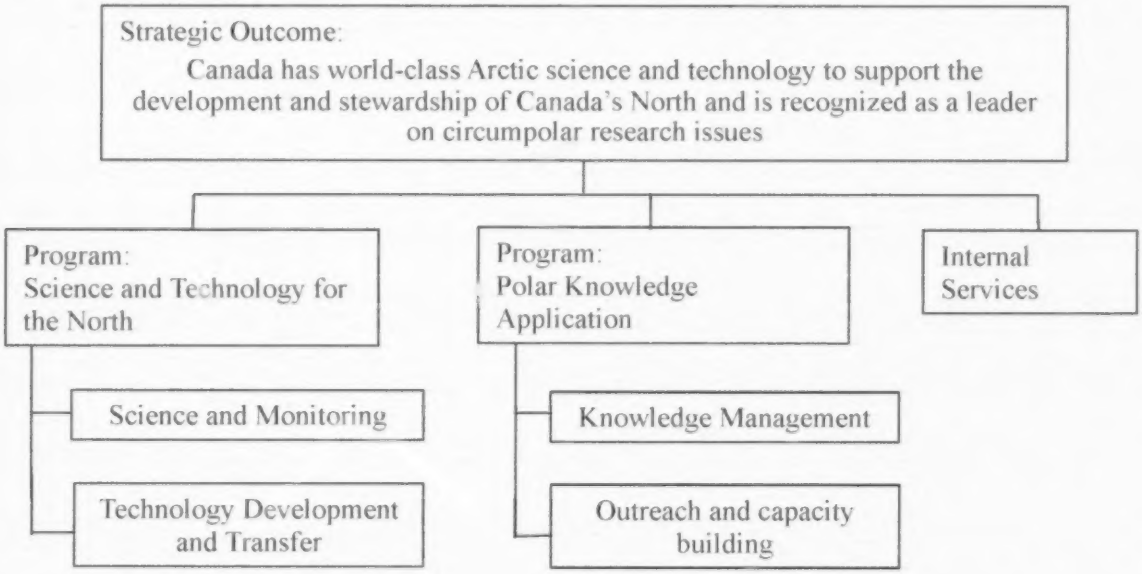
1.2 Program: Polar Knowledge Application

1.2.1 Sub-Program: Knowledge Management

1.2.2 Sub-Program: Outreach and Capacity Building

Internal Services

The Program Alignment Architecture is depicted in the chart below.


Strategic Outcome:
Canada has world-class Arctic science and technology to support the development and stewardship of Canada's North and is recognized as a leader on circumpolar research issues
Program:
Science and Technology for the North
Program:
Polar Knowledge Application
Internal Services
Science and Monitoring
Technology Development and Transfer
Knowledge Management
Outreach and capacity building

Organizational Priorities

Priority: Alternative and renewable energy for the North

Reduce the dependency on high-cost imported energy, explore feasibility of local sources and enhance northern application of alternative technologies. Work with national and international technology leaders to ensure the latest advances in new energy technology are tested in northern conditions so that they become increasingly available to Northerners. *(New priority)*

Key Supporting Initiatives

Planned Initiatives	Start Date	End Date	Link to Program Alignment Architecture
"Northernization" of existing technologies. Adapt, use and test prototypes in Cambridge Bay to develop integrated alternative energy systems suited to supply power to households in town or at remote locations.	April 2016	To be determined	1.1.2 Technology Development and Transfer
Assess local energy sources. Investigate potential for the use of solar and wind power, biomass, permafrost methane and smart metering to inform decisions on energy technology for communities.	April 2016	To be determined	1.1.2 Technology Development and Transfer
Energy storage solutions. Work with industry and government partners to adapt energy storage technology solutions to the North.	April 2016	To be determined	1.1.2 Technology Development and Transfer

Priority: Baseline information to prepare for northern sustainability

Improve decision support for sustainable communities and responsible development in the North. *(New priority)*

Key Supporting Initiatives

Planned Initiatives	Start Date	End Date	Link to Program Alignment Architecture
Strengthen the information base for improved land-based decision-making. Enhanced characterization, knowledge, understanding and monitoring of Valuable Ecosystem Components (VEC); large area information collection using airborne and satellite-based remote sensing; and modelling of data.	April 2016	To be determined	1.1.1. Science and Monitoring
Strengthen the information base for safe shipping. improved marine decision making. Enhanced characterization, knowledge and monitoring; in situ and remotely-sensed observation; modelling of data.	April 2016	To be determined	1.1.1. Science and Monitoring

Priority: Predicting the impacts of changing ice, permafrost and snow on shipping, infrastructure and communities

Increase knowledge of the frozen elements of the terrestrial and marine cryosphere to support adaptation and improve climate models. Work with the leading players to strengthen cryosphere research to understand how and why changes are happening in ice, snow, and permafrost across the Arctic and the impact of these changes on shipping, infrastructure and global processes. *(New priority)*

Key Supporting Initiatives

Planned Initiatives	Start Date	End Date	Link to Program Alignment Architecture
Understanding changing terrestrial cryosphere. Better understand terrestrial cryosphere changes and improve ability to predict impacts of change.	April 2016	To be determined	1.1.1. Science and Monitoring
Understanding changing ice conditions. Changing sea ice conditions and their impact on weather patterns, local climate and marine shipping.	April 2016	To be determined	1.1.1. Science and Monitoring
Improved predictive capacity. Integrate Canadian cryospheric and sea-ice data into global prediction models.	April 2016	To be determined	1.1.1. Science and Monitoring

Priority: Catalyzing improved design, construction and maintenance of northern built infrastructure

Apply innovative designs, materials and techniques to increase energy efficiency, quality, and reduce life-cycle costs of northern infrastructure. *(New priority)*

Key Supporting Initiatives

Planned Initiatives	Start Date	End Date	Link to Program Alignment Architecture
Research, develop and test energy efficient housing for the North. Research, develop and test the latest advances in energy efficient housing for the North.	April 2016	To be determined	1.1.2 Technology Development and Transfer
Adapt waste processing systems to northern environments. Apply innovative designs, materials and techniques to increase energy efficiency and reduce life-cycle costs.	April 2016	To be determined	1.1.2 Technology Development and Transfer

Priority: Knowledge management and engagement

Engage key stakeholders and indigenous communities, and produce and disseminate science and technology results through a variety of media to support the translation of knowledge into tangible outcomes.

Key Supporting Initiatives

Planned Initiatives	Start Date	End Date	Link to Program Alignment Architecture
Engage domestic stakeholders and indigenous communities, and encourage collaboration to support the production and dissemination of science and technology results. Through the hosting of workshops on topics including oceans, infrastructure, and the Antarctic and related follow-up activities to facilitate discussion of priority research gaps and areas for collaboration.	April 2016	To be determined	1.2.1. Knowledge Management
Increase international collaboration and partnerships to support the production of science and technology results. Through the hosting of the Arctic Council's Science Task Force Meeting, participation at international science conferences and polar events to establish contacts, and establishment of institution-level cooperation agreements.	April 2016	To be determined	1.2.1. Knowledge Management
Facilitate improved access to data and information. Through collaboration with the Polar Data Catalogue and policies that ensure open access to data, and synthesis of scientific information into value-added knowledge products to support decision-making.	April 2016	To be determined	1.2.1. Knowledge Management

Priority: Outreach and capacity building

Work with partner organizations to build awareness of Arctic and Antarctic science and technology domestically and internationally and build capacity through training, outreach and employment opportunities.

Key Supporting Initiatives

Planned Initiatives	Start Date	End Date	Link to Program Alignment Architecture
Strengthen awareness of POLAR's mandate and science and technology in the Polar Regions among a broad audience. Through the release of external communications products and tools including the video 'What is Polar Knowledge Canada', the Polar Knowledge App and the Polar Blog.	April 2016	To be determined	1.2.2. Outreach and capacity building
Advance and support the next generation of researchers and highly qualified personnel. Through an assessment of existing northern capacity-building initiatives to identify gaps that POLAR is well placed to address, and support for the delivery of science camps to northern youth.	April 2016	To be determined	1.2.2. Outreach and capacity building

For more information on organizational priorities, see the Minister's mandate letter on the Prime Minister of Canada's website.[i]

Risk Analysis

Key Risks

Risk	Risk Response Strategy	Link to Program Alignment Architecture
Technology failure. Technologies that are tested may not be suitable to the extreme northern environments and may therefore be abandoned as viable options.	Rigorous project planning and risk assessment; periodic re-evaluations of projects; consultation with technology leaders; testing of multiple technologies; and building on previous work and lessons learned.	▪ 1.1.2 Technology development and transfer
Community buy-in. Northern communities may not be receptive to certain technology solutions.	Community outreach and engagement; community involvement in projects; development of local capacity.	▪ 1.2.2 Outreach and capacity building
Limited local technical capacity. Some demonstration/pilot projects will require technical capacity at the community level, and will be hindered if such capacity is not available.	Plan for community involvement in projects; provide training/internship support; and ongoing community outreach and communications.	▪ 1.2.2 Outreach and capacity building
Lack of private sector interest in pursuing northern markets. Lack of interest in partnering if there is insufficient market potential for technologies.	POLAR contribution programs will be used as an incentive to attract the interest of the private sector. Other response measures will include market assessments as well as scaling projects to market potential.	▪ 1.2.1 Knowledge management ▪ 1.1.2 Technology development and transfer
Ability to attract and retain staff with the required competencies in a timely manner. Given the remote location and climate of Cambridge Bay.	Collective and anticipatory staffing, fast track staffing processes, partnerships with educational institutions, human resources planning, competency profiling, and innovative human resources programs to attract and retain staff.	▪ Internal services

Canada's North is undergoing significant change driven by a number of complex factors, some global in nature, others rooted in the dynamics of the region's unique history, and others stemming from the increased empowerment of indigenous peoples through settled comprehensive land claims. Key influences at this time on scientific research and technology development include:

- Rapid environmental transformations occurring in the Arctic are affecting the entire Earth system, including its climate and weather extremes, through increased temperatures and the continuing loss of ice, glaciers, snow and permafrost. These changes in the Arctic are challenging our understanding of their consequences and our ability to provide knowledge for decision-makers.

- New economic interests in the Arctic have established the region as a larger player in the global economy, but also with very significant local effects. In spite of rapid environmental and social change, the Arctic remains a region of geopolitical stability which is a pre-condition for sustaining Arctic research.
- Increasing political and economic empowerment of Northerners exemplified by the devolution of responsibility for lands and resource management to territorial governments and the gradual shifting of the control of the research agenda northward.
- Ongoing advances in indigenous self-government taking place throughout the region and their positive effects on government policies, including how research is undertaken.
- Heightened northern interest on the part of Canadians.

Developing local technical capacity and ensuring community buy-in and participation will be critical to technology development and transfer in the North. The private sector must also be motivated to pursue the smaller northern markets for these new technologies.

Planned Expenditures

Budgetary Financial Resources (dollars)

2016–17 Main Estimates	2016–17 Planned Spending	2017–18 Planned Spending	2018–19 Planned Spending
19,475,274	19,475,274	19,125,002	28,940,418

Human Resources (Full-Time Equivalents FTEs)

2016–17	2017–18	2018–19
51	57	75

Budgetary Planning Summary for Strategic Outcome and Programs (dollars)

Strategic Outcome(s), Program(s) and Internal Services	2013–14 Expenditures	2014–15 Expenditures	2015–16 Forecast Spending	2016–17 Main Estimates	2016–17 Planned Spending	2017–18 Planned Spending	2018–19 Planned Spending
Strategic Outcome: Canada has world-class Arctic science and technology to support the development and stewardship of Canada's North and is recognized as a leader on circumpolar research issues.							
1.1 Science and Technology for the North	n/a	n/a	n/a	13,679,282	13,679,282	12,811,623	19,052,431
1.2 Polar Knowledge Application	n/a	n/a	n/a	2,993,760	2,993,760	3,298,843	4,212,037
Subtotal	n/a	n/a	n/a	16,673,042	16,673,042	16,110,466	23,264,468
Internal Services Subtotal	n/a	n/a	n/a	2,802,232	2,802,232	3,014,536	5,675,950
Total	n/a	n/a	n/a	19,475,274	19,475,274	19,125,002	28,940,418

Given that POLAR is still in start-up mode, the figures shown above for planned spending are estimates and will evolve as POLAR plans are developed to a greater level of detail.

Alignment of Spending With the Whole-of-Government Framework

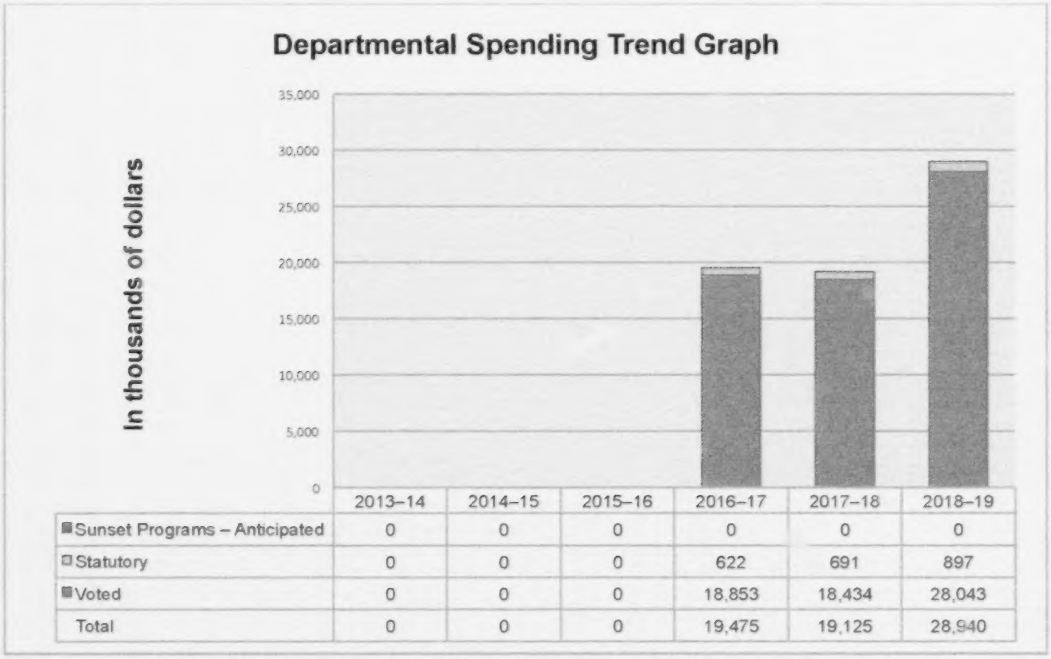
Alignment of 2016–17 Planned Spending With the Whole-of-Government Framework[ii] (dollars)

Strategic Outcome	Program	Spending Area	Government of Canada Outcome	2016–17 Planned Spending
Canada has world-class Arctic science and technology to support the development and stewardship of Canada's North and is recognized as a leader on circumpolar research issues.	1.1 Science and Technology for the North	Economic affairs	A clean and healthy environment	13,679,282
	1.2 Polar Knowledge Application	Economic affairs	An innovative and knowledge-based economy	2,993,760

Total Planned Spending by Spending Area (dollars)

Spending Area	Total Planned Spending
Economic affairs	16,673,042

Departmental Spending Trend



	2013–14	2014–15	2015–16	2016–17	2017–18	2018–19
Sunset Programs – Anticipated	0	0	0	0	0	0
Statutory	0	0	0	622	691	897
Voted	0	0	0	18,853	18,434	28,043
Total	0	0	0	19,475	19,125	28,940

Spending increases in 2018-2019 as POLAR assumes responsibility for the operation and maintenance of the Canadian High Arctic Research Station.

Estimates by Vote

For information on Polar Knowledge Canada's organizational appropriations, consult the 2016–17 Main Estimates.[iii]

Section II: Analysis of Programs by Strategic Outcome

Strategic Outcome: Canada has world-class Arctic science and technology to support the development and stewardship of Canada's North and is recognized as a leader on circumpolar research issues.

This section describes the key activities and initiatives within each of the programs as well as internal services:

- Science and Technology for the North: scientific research and monitoring and technology development and transfer
- POLAR Knowledge Application: knowledge management and mobilization, that is, publishing and disseminating studies, reports and other documents on the results of the research as well as outreach and capacity building in the North
- Internal services: human resources and other corporate services.

The key delivery strategies for all the programs are:

- Consultation as an integral part of POLAR's activities. Input will be sought from indigenous groups and local communities in the development of research plans and implementation of technology projects. There will be a high priority on involving and engaging with stakeholders and indigenous communities, and building capacity at the community level through training and participation in projects.
- POLAR will leverage it's capacity by partnering and establishing collaborative arrangements, building on the expertise and knowledge that already exists in other national and international polar research organizations. POLAR will serve as Canada's primary point of contact with the circumpolar knowledge community; and actively seek to establish agreements and partnerships with polar research agencies at the national and international level to attract international scientists to work in Canada.
- POLAR will target cross-disciplinary, cross-sectoral issues that require collaboration across multiple organizations and disciplines. The Canadian High Arctic Research Station (CHARS) in Cambridge Bay, Nunavut, will provide a world-class hub for science and technology that complements and strengthens the diverse network of facilities across the North, including the members of the Canadian Network of Northern Research Operators.
- POLAR will use grants and contributions as a leveraging tool to access the capacity of well-established science centres of expertise and/or private sector technology leaders; and have direct competitive and peer-reviewed processes that fund external recipients with shared goals (e.g., academics, communities, not for profit organizations, industry, governments, and international scientists).

Program 1.1: Science and Technology for the North

Description

This program aims to create the conditions for Polar Knowledge Canada to anchor a strong research presence in Canada's Arctic. Through both partnering and internal science and technology, POLAR will acquire the wide range of information needed for effective solutions to Arctic issues, policy and research program development in the North, and to advance Canada's position as a leading Arctic nation. The depth of knowledge gained through scientific and technological research and training will support greater sustainable use of the North's land and natural resources.

Budgetary Financial Resources (dollars)

2016–17 Main Estimates	2016–17 Planned Spending	2017–18 Planned Spending	2018–19 Planned Spending
13,679,282	13,679,282	12,811,623	19,052,431

Human Resources (Full-Time Equivalents FTEs)

2016–17	2017–18	2018–19
22	25	32

Performance Measurement

Expected Results	Performance Indicators	Targets	Date to Be Achieved
Sustainable use of Arctic land and resources is supported by science and technology research and training activities facilitated by the Canadian High Arctic Research Station	Percentage of Northerners using science and technology training camps and training opportunities at POLAR	To be determined	To be determined

Planning Highlights

Key POLAR engagement strategies to leverage its resources to facilitate and foster science and technology research and training in the North will be:

- To focus engagement activities on government (federal science departments, territorial science groups); domestic science community (research organizations, academia); international research organizations (leveraging Global Affairs Canada contacts in targeted countries); Cambridge Bay; indigenous communities; and industry.
- Within the international science community, focus partnership activities on Arctic States as well as non-Arctic States with strong polar expertise and interests; and states that have relevant polar expertise or interests or can provide an information/brokerage role.
- Work in close collaboration with the main science associations and networks.

Key success indicators will be the number of partnership agreements negotiated with stakeholders and indigenous organizations, investment by other stakeholders in research activities with POLAR, the number of joint research projects between POLAR and partner research organizations, and the number of international scientists working with POLAR.

Sub-Program 1.1.1: Science and Monitoring

Description

Pursue partnerships with organizations in order to collaborate on cross-disciplinary, cross-sectoral issues, leveraging their experience, expertise, and resources. Provide direct competitive and peer-reviewed processes that fund external recipients with shared goals (e.g., academics, communities, not-for-profit organizations, industry, governments, and international scientists). Funding to external recipients will be guided by relevance to the Science and Technology Plan, scientific excellence, and the extent to which projects strengthen northern capacity and leadership in science and monitoring.

Budgetary Financial Resources (dollars)

2016–17 Planned Spending	2017–18 Planned Spending	2018–19 Planned Spending
6,018,884	5,778,042	9,011,800

Human Resources (Full-Time Equivalents FTEs)

2016–17	2017–18	2018–19
10	11	15

Performance Measurement

Expected Results	Performance Indicators	Targets	Date to Be Achieved
Projects funded by POLAR and carried out by external recipients strengthen northern capacity and leadership in science and monitoring	Percentage of projects/sites and activities targeted to science and monitoring completed by external recipients	100%	March 31, 2019

Planning Highlights

In addition to launching CHARS operations in 2017-2018, POLAR will contribute to northern capacity and leadership in science and monitoring by:

- Building on the expertise and knowledge that already exists in other national and international research organizations
- Using contributions as a leveraging tool to seek the participation of well-established science centres of expertise and/or private sector technology leaders
- Delivering knowledge products to policy and decision-makers
- Making tools and models available to the science community (e.g., predictive models, cumulative effects assessment, risk assessment, scenarios modelling)
- Proposing thresholds/guidelines to help manage change for industry and northern communities.

Indicators of success will be the number of joint research projects, the level of take up on competitive award processes, the number of scientists working with POLAR programs and expedition-participants to CHARS, and publications resulting from POLAR supported research.

Sub-Program 1.1.2: Technology Development and Transfer

Description

Establish CHARS as a major hub for Arctic technology development; and aim to foster northern technology development by providing a research platform, expertise, infrastructure, and funding to support northern entrepreneurs and innovators in development, adapting, and testing technologies that could be used in the North. POLAR will work with Northerners to create an environment at CHARS and in its work in which both traditional knowledge and science contribute to building solutions to challenges in the Arctic.

Budgetary Financial Resources (dollars)

2016–17 Planned Spending	2017–18 Planned Spending	2018–19 Planned Spending
7,660,398	7,033,581	10,040,631

Human Resources (Full-Time Equivalents FTEs)

2016–17	2017–18	2018–19
12	14	17

Performance Measurement

Expected Results	Performance Indicators	Targets	Date to Be Achieved
Solutions to Arctic challenges are developed by a combination of traditional knowledge and science and technology	Percentage of G&C's directly targeted for northern technology development	45%	March 31, 2018

Planning Highlights

POLAR will contribute to technology development and transfer by:

- Working with industry and technology leaders to bring technologies to the North and test and adapt these technologies to better work in the extreme northern environments
- Establishing testing and demonstration sites, and developing and operating prototypes at these sites to demonstrate their viability and cost savings to northern communities
- Identifying best practices, technology innovations and cost-effective concept designs
- Developing marketing strategies and generating market interest for the most promising technologies.

Indicators of success will be the number of technology development projects with external partners, the number of prototypes tested and adapted to northern conditions, community usage of successful technology solutions, and the level of replication in other northern communities.

In the longer term, success will be the private sector developing, marketing and distributing cost effective products adapted to northern requirements; and the achievement of eventual cost savings for communities as well as improved living conditions.

Program 1.2: Polar Knowledge Application

Description

Lead the mobilization of polar science and technology into action. POLAR will analyze and disseminate polar knowledge from its Science and Technology Program, as well as that from other federal, territorial and other stakeholders, and investments to inform management, programming, and policies; promote Arctic science and technology nationally and internationally; and build capacity through training, outreach, and learning opportunities. This will ensure polar knowledge is relevant to stakeholders and indigenous communities, and builds a science culture in Canada that incorporates indigenous and local knowledge.

Budgetary Financial Resources (dollars)

2016–17 Main Estimates	2016–17 Planned Spending	2017–18 Planned Spending	2018–19 Planned Spending
2,993,760	2,993,760	3,298,843	4,212,037

Human Resources (Full-Time Equivalents FTEs)

2016–17	2017–18	2018–19
19	21	28

Performance Measurement

Expected Results	Performance Indicators	Targets	Date to Be Achieved
Canada's science and technology programming and policies are improved by polar science and technology knowledge and the incorporation of indigenous and local knowledge	Percentage of projects directly linked to domestic and international investment of Arctic programming and policies	100%	March 31, 2019

Planning Highlights

The initial focus of POLAR will be on developing strategies and approaches for data management, knowledge mobilization, communications and community outreach.

- Data management: to facilitate better access to information, support information sharing, enable access to POLAR research files and encourage collaboration with respect to information and knowledge management on the North.
- Knowledge mobilization: to synthesize scientific information produced by POLAR and other key stakeholders into value-added knowledge products to enable key decisions on the polar regions; and to ensure data, information and knowledge on polar themes are easily discoverable, accessible, disseminated strategically (timing and channels), and meet the needs of stakeholders.
- Communications: tools and processes to communicate externally and internally, using the latest social media and communications technologies.

- Community outreach: the use of webinars and other techniques to foster contact with local communities, key stakeholder groups, indigenous communities, and international initiatives.

The knowledge mobilization plans and priorities are described under each sub-program.

Sub-Program 1.2.1: Knowledge Management

Description

Knowledge management will involve engaging key stakeholders and the production and dissemination of science and technology results. This will happen through scientific papers as well as through a variety of media including policy briefs, social media, input to program design, scientific assessments, decision-support tools and models. POLAR will support the translation of knowledge into tangible outcomes for local communities, industry, decision-makers, indigenous communities and stakeholders across all of the science and technology activities.

Budgetary Financial Resources (dollars)

2016–17 Planned Spending	2017–18 Planned Spending	2018–19 Planned Spending
1,317,254	1,487,778	1,992,294

Human Resources (Full-Time Equivalents FTEs)

2016–17	2017–18	2018–19
7	8	10

Performance Measurement

Expected Results	Performance Indicators	Targets	Date to Be Achieved
Knowledge gathered and produced by the Station informs polar science and technology stakeholders	Percentage of media dissemination to key stakeholders including indigenous communities	100%	March 31, 2019

Planning Highlights

POLAR will synthesize scientific information, assess the policy implications and publish knowledge products to enable decision-makers to use this knowledge. This will involve:

- Managing POLAR collected and generated knowledge, so that POLAR becomes the source where people go for scientific knowledge (not just data and information), and science reports that translate the results of science activities into a language that is amenable for public consumption. Examples of current reports on the POLAR website include Reports on the State of Northern Knowledge in Canada and the State of Environmental Monitoring in Northern Canada.
- Synthesis of scientific information and data on the Arctic and Antarctica to identify the relevant and contextual value-added, through research, information gathering, and tailoring the reports for various target audiences.
- Sharing the results through social media (e.g., Polar Knowledge App, Polar Blog).

Information and knowledge on polar themes will be more discoverable, accessible, disseminated strategically (timing and channels), and meet the needs of stakeholders and indigenous communities. Improved knowledge will be available to inform policy and evidence-based decision-making.

Indicators of success will be the extent to which stakeholders access POLAR knowledge products; and policy and government decision-makers use the information for decision-making.

Sub-Program 1.2.2: Outreach and Capacity Building

Description

POLAR aims to build capacity through training, outreach and employment opportunities. POLAR will work with partner organizations to use northern science and technology to promote and build a science culture in Canada, and to build awareness of Arctic science and technology domestically and internationally. Outreach will include dedicated support for engagement activities, and building and maintaining POLAR's social media and web presence. Capacity Building will manage and support partnered activities and initiatives to advance and support the next generation of researchers and highly qualified personnel and to strive to fulfill Canada's obligations under Article 23 of the Nunavut Land Claims Agreement.

Budgetary Financial Resources (dollars)

2016–17 Planned Spending	2017–18 Planned Spending	2018–19 Planned Spending
1,676,506	1,811,065	2,219,743

Human Resources (Full-Time Equivalents FTEs)

2016–17	2017–18	2018–19
12	13	18

Performance Measurement

Expected Results	Performance Indicators	Targets	Date to Be Achieved
Northern youth and the domestic and international science and policy community are made aware of Canadian world class knowledge on Arctic science and technology and current and future job opportunities at the Station	Percentage of job opportunities in the North	60%	March 31, 2018
	Percentage of activities for outreach and capacity building	20%	March 31, 2018

Planning Highlights

The initial focus of outreach and capacity building will be on communications, in particular:

- Branding, to create awareness through communications products such as a video *"What is Polar Knowledge Canada?"*, brochures, and other promotional material.
- Hosting workshops that bring together key interlocutors on priority issues as well as information sessions at major federal science departments and organizations to explain the mandate and future plans for POLAR (e.g., *Polar talk series*).
- Creating external communications products, for example, a revamped website/portal, updating the Polar Knowledge App, the POLAR blog, exhibitions including a photo exhibit of CHARS and storyline, youth engagement education/classroom activities and resources, annual science reports.

- Participating and being visible at science conferences and polar events in order to establish contacts and discuss opportunities with stakeholders and disseminate knowledge. In the medium to long term, options could include travelling photo exhibits placed in Canadian diplomatic posts abroad; and a public exhibition in Ottawa that would profile POLAR, and feature research highlights, displays and interactive applications.
- Leverage existing and new partnerships to communicate the results to the public.
- Use of webinars and other techniques to maintain contact with local communities, key stakeholder groups, and international initiatives.
- Continuing to administer the Northern Scientific Training Program that supports and encourages young northern researchers, and work to increase the program's effectiveness.
- Presenting the Northern Science Award to recognize knowledge creation that benefits northerners.

In the longer term, community outreach will be critical to obtain community input, feedback, and participation and foster capacity building. The focus will be on involving and engaging with stakeholders and indigenous groups and building capacity at the community level through training and participation in science and technology projects.

Community outreach will be critical to ensure communities are given the opportunity to provide input into pilot and demonstration projects, have ready access to the test results and can provide feedback and/or validate the results, and are engaged in any follow-up/ implementation. Some demonstration/pilot projects will require technical capacity at the community level, and will be hindered if such capacity is not available.

Finally, POLAR will also strive to be an active and respectful member of our host community, Cambridge Bay, Nunavut.

Indicators of success will be the level of buy-in to projects in northern communities, awareness of the POLAR mandate in scientific research organizations (nationally and internationally), the level of public awareness of POLAR (based on public opinion surveys), the level of media coverage (trend in the number of media references), and web traffic volume based on web analytics data.

Internal Services

Description

Internal Services are groups of related activities and resources that are administered to support the needs of programs and other corporate obligations of an organization. Internal services include only those activities and resources that apply across an organization, and not those provided to a specific program. The groups of activities are Management and Oversight Services; Communications Services; Legal Services; Human Resources Management Services; Financial Management Services; Information Management Services; Information Technology Services; Real Property Services; Materiel Services; and Acquisition Services.

Budgetary Financial Resources (dollars)

2016–17 Main Estimates	2016–17 Planned Spending	2017–18 Planned Spending	2018–19 Planned Spending
2,802,232	2,802,232	3,014,536	5,675,950

Human Resources (Full-Time Equivalents FTEs)

2016–17	2017–18	2018–19
10	11	15

Planning Highlights

A key challenge for POLAR will be the ability to attract and retain staff with the required competencies in a timely manner given the remote location in Cambridge Bay, the highly specialized nature of functions and positions, and the learning time required to become fully operational. As a new organization, POLAR will also need to establish a suite of management policies and processes specific to its requirements and that are consistent with Canada's obligations under the Nunavut Land Claims Agreement; and seek permanent funding beginning in 2017-2018. Key plans and priorities will therefore be:

- Support staffing for the POLAR organization to increase internal capacity and recruit staff to CHARS in Cambridge Bay once facilities are operational.
- Implement human resources business processes and programs, in particular, for performance management, compensation and benefits, and learning and leadership development.
- Develop human resource/succession planning strategies to transfer knowledge to new staff, with a focus on functions and positions where the organization is most at risk.
- Establish and standardize corporate services processes across the organization, and establish and validate service standards for the delivery of corporate services with client managers and staff.
- Clarify financial management governance to ensure managers at all levels take full accountability for their budgeting and forecasting, and the delivery of projects within

budget constraints. Establish forecasting tools and engage managers in financial forecasting to ensure the reliability of forecasts and manager accountability.

- Establish the appropriate level of financial/procurement and other internal controls that are cost-effective considering the level of risk.
- Assess options for the corporate systems, in particular, the human resources and financial information systems.
- Establish an information management classification structure based upon a common classification schema supported by a document management tool.
- Establish information technology strategy, plans and priorities, and review options for information technology user support.
- Review security management, security policies and processes, including the arrangements for security clearances and controls in place for information technology security.
- Establish an occupational health and safety program and policies (including an occupational health and safety committee).
- Seek legal authorities for property management related to the CHARS campus.

Section III: Supplementary Information

Future-Oriented Statement of Operations

The future-oriented financial statements are not available at this time. POLAR began operations on June 1, 2015, and continues to work to consolidate this information. The first POLAR future-oriented financial statements will be presented in the organization's 2017-2018 Report on Plans and Priorities.

Supplementary Information Tables

The supplementary information tables listed in the 2016–17 Report on Plans and Priorities are available on Polar Knowledge Canada's website.

- Departmental Sustainable Development Strategy
- Details on Transfer Payment Programs of $5 Million or More
- Disclosure of Transfer Payment Programs Under $5 Million

Tax Expenditures and Evaluations

The tax system can be used to achieve public policy objectives through the application of special measures such as low tax rates, exemptions, deductions, deferrals and credits. The Department of Finance Canada publishes cost estimates and projections for these measures each year in the Tax Expenditures and Evaluations[iv] publication. The tax measures presented in that publication are the responsibility of the Minister of Finance.

Section IV: Organizational Contact Information

POLAR's Ottawa Office
2464 Sheffield Road
Ottawa, ON, K1B 4E5
Canada

POLAR's Science and Technology Program Interim Office
360 Albert Street, 17th floor
Ottawa, ON, K1R 7X7
Tel.: (613) 943-8605

David J. Scott, Ph.D., President and Chief Executive Officer
Tel. (613) 943-8605
Email : info@polar.gc.ca

Appendix: Definitions

Appropriation: Any authority of Parliament to pay money out of the Consolidated Revenue Fund.

budgetary expenditures: Operating and capital expenditures; transfer payments to other levels of government, organizations or individuals; and payments to Crown corporations.

Departmental Performance Report: Reports on an appropriated organization's actual accomplishments against the plans, priorities and expected results set out in the corresponding Reports on Plans and Priorities. These reports are tabled in Parliament in the fall.

full-time equivalent: A measure of the extent to which an employee represents a full person-year charge against a departmental budget. Full-time equivalents are calculated as a ratio of assigned hours of work to scheduled hours of work. Scheduled hours of work are set out in collective agreements.

Government of Canada outcomes: A set of 16 high-level objectives defined for the government as a whole, grouped in four spending areas: economic affairs, social affairs, international affairs and government affairs.

Management, Resources and Results Structure: A comprehensive framework that consists of an organization's inventory of programs, resources, results, performance indicators and governance information. Programs and results are depicted in their hierarchical relationship to each other and to the Strategic Outcome(s) to which they contribute. The Management, Resources and Results Structure is developed from the Program Alignment Architecture.

non-budgetary expenditures: Net outlays and receipts related to loans, investments and advances, which change the composition of the financial assets of the Government of Canada.

performance: What an organization did with its resources to achieve its results, how well those results compare to what the organization intended to achieve, and how well lessons learned have been identified.

performance indicator: A qualitative or quantitative means of measuring an output or outcome, with the intention of gauging the performance of an organization, program, policy or initiative respecting expected results.

performance reporting: The process of communicating evidence-based performance information. Performance reporting supports decision making, accountability and transparency.

planned spending: For Reports on Plans and Priorities (RPPs) and Departmental Performance Reports (DPRs), planned spending refers to those amounts that receive Treasury Board approval by February 1. Therefore, planned spending may include amounts incremental to planned expenditures presented in the Main Estimates.

A department is expected to be aware of the authorities that it has sought and received. The determination of planned spending is a departmental responsibility, and departments must be able to defend the expenditure and accrual numbers presented in their RPPs and DPRs.

plans: The articulation of strategic choices, which provides information on how an organization intends to achieve its priorities and associated results. Generally a plan will explain the logic behind the strategies chosen and tend to focus on actions that lead up to the expected result.

priorities: Plans or projects that an organization has chosen to focus and report on during the planning period. Priorities represent the things that are most important or what must be done first to support the achievement of the desired Strategic Outcome(s).

program: A group of related resource inputs and activities that are managed to meet specific needs and to achieve intended results and that are treated as a budgetary unit.

Program Alignment Architecture: A structured inventory of an organization's programs depicting the hierarchical relationship between programs and the Strategic Outcome(s) to which they contribute.

Report on Plans and Priorities: Provides information on the plans and expected performance of appropriated organizations over a three-year period. These reports are tabled in Parliament each spring.

results: An external consequence attributed, in part, to an organization, policy, program or initiative. Results are not within the control of a single organization, policy, program or initiative; instead they are within the area of the organization's influence.

statutory expenditures: Expenditures that Parliament has approved through legislation other than appropriation acts. The legislation sets out the purpose of the expenditures and the terms and conditions under which they may be made.

Strategic Outcome: A long-term and enduring benefit to Canadians that is linked to the organization's mandate, vision and core functions.

sunset program: A time-limited program that does not have an ongoing funding and policy authority. When the program is set to expire, a decision must be made whether to continue the program. In the case of a renewal, the decision specifies the scope, funding level and duration.

target: A measurable performance or success level that an organization, program or initiative plans to achieve within a specified time period. Targets can be either quantitative or qualitative.

voted expenditures: Expenditures that Parliament approves annually through an Appropriation Act. The Vote wording becomes the governing conditions under which these expenditures may be made.

whole-of-government framework: Maps the financial contributions of federal organizations receiving appropriations by aligning their Programs to a set of 16 government-wide, high-level outcome areas, grouped under four spending areas.

Endnotes

i. Prime Minister of Canada's website, http://pm.gc.ca/eng/ministerial-mandate-letters
ii. Whole-of-government framework, http://www.tbs-sct.gc.ca/ems-sgd/wgf-ipp-eng.asp
iii. 2016–17 Main Estimates, http://www.tbs-sct.gc.ca/hgw-cgf/finances/pgs-pdg/gepme-pdgbpd/index-eng.asp
iv. Tax Expenditures and Evaluations publication, http://www.fin.gc.ca/purl/taxexp-eng.asp